

## APPENDIX D

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### STATEMENT OF WORK FOR THE REMEDIAL ACTION AT THE REASOR CHEMICAL COMPANY SUPERFUND SITE NEW HANOVER COUNTY, NORTH CAROLINA

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STATEMENT OF WORK FOR THE  
REMEDIAL ACTION AT THE  
REASOR CHEMICAL COMPANY SUPERFUND SITE

**I. INTRODUCTION**

This Statement of Work (SOW) outlines the work to be performed by the Defendants at the Reasor Chemical Company Superfund Site in Castle Hayne, New Hanover County, North Carolina ("the Site"). The work outlined is intended to implement the remedy as described in the Record of Decision (ROD) for the Site, dated September 26, 2002, (not including the groundwater treatment contingency remedy), modifications associated with the ROD, and to achieve the Performance Standards set forth in the ROD, modifications associated with the ROD, Consent Decree (CD), and this SOW. The requirements of this SOW will be further detailed in work plans and other documents to be submitted by the Defendants for approval as set forth in this SOW. It is not the intent of this document to provide task specific engineering or geological guidance. The definitions set forth in Section III of the CD shall also apply to this SOW unless expressly provided otherwise herein.

Defendants are responsible for performing the Work to implement the selected remedy. EPA shall conduct oversight of the Defendants' activities throughout the performance of the Work. The Defendants shall assist EPA in conducting oversight activities.

EPA review or approval of a task or deliverable shall not be construed as a guarantee as to the adequacy of such task or deliverable. If EPA modifies a deliverable pursuant to Section XIII of the CD, such deliverable as modified shall be deemed approved by EPA for purposes of this SOW. A summary of the major deliverables that Defendants shall submit for the Work is attached.

**II. OVERVIEW OF THE REMEDY**

The objectives of this remedial action are:

**SOIL:** to prevent further migration of contaminants from soil to groundwater and surface water and to eliminate the unacceptable risk to human health and the environment from contaminated soil by attaining the human health and ecological risk based cleanup goals for the following contaminants of concern: benzo(a)pyrene, benzo(a)anthracene, benzo(b &/or k)fluoranthene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, Total PAHs, antimony, copper, and lead.

**SEDIMENT:** to prevent further migration of contaminants from sediment to groundwater and surface water, and to eliminate exposure of ecological receptors to contaminated sediment by achieving ecological risk based sediment cleanup goals for the following contaminants of concern: methyl ethyl ketone, toluene, (3-and/or 4-)methylphenol, total PAHs, and copper.

**SURFACE WATER:** to prevent further migration of contaminants to soil, groundwater and down-gradient surface water bodies, and to eliminate exposure to contaminated surface water by aquatic receptors by achieving the North Carolina Surface Water Quality Standards (NCAC Title 15A, Chapter 2, Subchapter 2L.0100 and 2L.0200) for the following contaminants of concern: copper, lead, iron and zinc.

**GROUNDWATER:** to restore groundwater to drinking water levels by attaining Federal Drinking Water or risk-based standards for the contaminants of concern: thallium (Federal Maximum Contaminant Levels (MCLs)) and aluminum (risk-based).

### **III. REMEDY**

#### **A. Components**

The major components of the remedy are described in Section 2.12, Selected Remedy section of the attached Record of Decision. In summary, the remedy selected by the ROD includes:

- Extraction and off-site disposal of approximately 500,000 gallons of contaminated surface water from ponds 1, 2, 3 and 4;
- Excavation and off-site disposal of approximately 1,600 cubic yards of contaminated soil and sediment from seven discrete locations: scrap copper area, drum disposal area, pipe shop area, pond 1, pond 2, pond 3 and pond 4;
- Backfill and vegetate the excavated areas with native species;
- Place recordations on property deeds indicating that the groundwater is contaminated with inorganic compounds;
- Perform annual monitoring of groundwater to determine if contaminants of concern continue to be elevated; and
- If groundwater contaminants of concern continue to be present in concentrations exceeding clean-up standards, a contingency remedy will be implemented.

Through negotiations related to this CD, the Defendants and EPA agreed to several modifications to the remedy. They include:

- The contingent groundwater remedy will not be a part of this CD.
- The Defendants shall take steps to raise the pH of the groundwater in the vicinity of well MW-7S/MW-7D and thereby reduce aluminum concentrations. The steps include adding limestone or other alkaline substance prior to backfilling and/or applying alkaline substance in the vicinity of well MW-7S/MW-7D for infiltration.
- Modification of the groundwater sampling and analysis monitoring program to limit the monitoring to two locations (MW-7S and MW-7D) rather than all wells, and for analysis to include turbidity, pH and

aluminum rather than the full suite of metals. Samples will be collected annually from Wells MW-7S and MW-7D and field tested for pH. If the pH is between 7.2 and 8.5 at any sampling event, a sample will be collected using best efforts to reduce turbidity, and will be analyzed for aluminum. Field data for turbidity and pH will be recorded at each sampling event. At four years after the initiation of the remedial action, samples will be collected from wells MW-7S and MW-7D and analyzed for aluminum, with pH and turbidity field data documented.

- Defendants may treat and dispose of surface water on-site in lieu of off-site treatment/disposal, if proposed in the Remedial Action Work Plan.
- After excavation, Defendants may re-establish the ponds as ponds rather than backfilling. However, if Defendants choose to backfill the ponds with soil and not return them to ponds, a wetland area will be created (either on- or off-site) to make up for the loss of wetland and open water habitat functions resulting from excavation and subsequent backfilling of four pond areas. Final location, design, and performance criteria of this wetland mitigation, necessary only if Defendants choose to backfill the ponds with soil and not return them to ponds, should be outlined in a Habitat Restoration Plan.

EPA will modify the ROD to reflect these changes.

B. Treatment

The treatment technologies for the remedy are described in Section 2.12, Selected Remedy section of the attached Record of Decision. If on-site surface water treatment is preferred by the Defendants, the treatment methods must be thoroughly described in the Remedial Action Work Plan. The remedy components mentioned in the second set of bullets in Section III.A will be reflected in a modification to the ROD.

C. Performance Standards

Defendants shall meet all Performance Standards, as defined in the CD including the standards set forth in the attached Record of Decision and modified ROD. However, groundwater monitoring, as described in Section III.A of this SOW and as anticipated to be set forth in the modified ROD, is the only requirement for that media in this CD.

Defendants shall operate the soil/sediment/surface water treatment systems until Defendants have demonstrated compliance with the respective Performance Standards, in accordance with the Performance Standards Verification Plan, which Defendants shall include as part of the Field Sampling and Analysis Plan.

D. Compliance Testing

Defendants shall perform compliance testing to ensure that all Performance Standards are met. The excavated areas and groundwater shall be tested in accordance with the Performance Standard Verification Plan developed pursuant to Section IV, Task III of this SOW. After demonstration of compliance with Performance Standards, Defendants shall test the Site, only with respect to groundwater, for a minimum of five years. The re-vegetated areas shall be monitored for a minimum period, as set forth in the Operations and Maintenance Plan to ensure they become reestablished to meet conditions as currently existing with respect to vegetation and wetlands on equivalent non-contaminated portions of the Site.

IV. PLANNING AND DELIVERABLES

The specific scope of this work shall be documented by Defendants in a Remedial Action (RA) Work Plan. Plans, specifications, submittals, and other deliverables shall be subject to EPA review and approval in accordance with Section XIII of the CD. All approved, final documents shall also be submitted to the EPA Remedial Project Manager (RPM) in electronic format, within 15 days of document approval notification.

Defendants shall submit a technical memorandum documenting any need for additional data along with the proposed Data Quality Objectives (DQOs) whenever such requirements are identified. Defendants are responsible for fulfilling additional data and analysis needs identified by EPA during the Remedial Action (RA) process consistent with the general scope and objectives of the CD, including this SOW.

Defendants shall perform the following tasks:

TASK I - PROJECT PLANNING

A. Site Background

Defendants shall gather and evaluate the existing information regarding the Site and shall conduct a visit to the Site to assist in planning the RA as follows:

1. Collect and Evaluate Existing Data and Document the Need for Additional Data

Before planning RA activities, all existing Site data shall be thoroughly compiled and reviewed by Defendants. Specifically, this shall include the ROD, RI/FS, RD, and other available data related to the Site. This information shall be utilized in determining additional data needed for RA implementation. Any additional data needed to evaluate the presence of elevated levels of aluminum in the groundwater, should be considered. Final decisions on the necessary data and

DQOs shall be made by EPA.

2. Conduct Site Visit

Defendants shall conduct a visit to the Site with the RPM during the project planning phase to assist in developing a conceptual understanding of the RA requirements for the Site, if EPA deems such joint visit to be necessary after verbal discussion between the RPM and Defendants and/or their representatives. Information gathered during this visit, if necessary, shall be utilized to plan the project and to determine the extent of the additional data necessary (if any) to implement the RA.

B. Project Planning

Once Defendants have collected and evaluated existing data and have conducted a visit to the Site with the RPM if deemed necessary under the preceding subsection, the specific project scope shall be planned. Defendants shall communicate with EPA at the completion of this evaluation regarding the following activities and before proceeding with Task II.

TASK II - REMEDIAL ACTION

Remedial Action shall be performed by Defendants to implement the response actions selected in the ROD and modifications associated with the ROD.

A. Remedial Action Planning

Within 30 days after EPA's issuance of an authorization to proceed pursuant to Paragraph 10 of the CD, Defendants shall submit a draft Remedial Action (RA) Work Plan and a Construction Health and Safety Plan/Contingency Plan. The RA Work Plan shall include necessary components for planning and managing construction. The RA Work Plan must be reviewed and approved by EPA and the Construction Health and Safety Plan/Contingency Plan reviewed and commented on by EPA prior to the initiation of the Remedial Action.

Upon approval of the RA Work Plan, Defendants shall implement the RA Work Plan in accordance with the construction management schedule. Significant field changes to the RA as set forth in the RA Work Plan and Final Design shall not be undertaken without the approval of EPA. The RA shall be documented in enough detail to produce as-built construction drawings after the RA is complete, if such drawings are necessary. Deliverables shall be submitted to EPA for review and approval in accordance with Section XIII of the CD. Review and/or approval of submittals does not imply acceptance of later submittals that have not been reviewed, nor that the remedy, when constructed, will meet Performance Standards.

1. RA Work Plan

A Work Plan which provides a detailed plan of action for completing the RA activities shall be submitted to EPA for review and approval. The objective of this work plan is to provide for the safe and efficient completion of the RA. The RA Work Plan shall include necessary components for planning and managing construction. The Work Plan shall be developed in conjunction with the Construction Health and Safety Plan/Contingency Plan and the Performance Standards Verification Plan (in Task III), although each plan may be delivered under separate cover. The Work Plan shall include a comprehensive description of the work to be performed and the Final Construction schedule for completion of each major activity and submission of each deliverable.

Specifically, the RA Work Plan shall present the following:

- a. A detailed description of the tasks to be performed and a description of the work products to be submitted to EPA. This includes the deliverables set forth in the remainder of Task II.
- b. A schedule for completion of each required activity and submission of each deliverable required by this CD, including those in this SOW.
- c. A project management plan, including provision for monthly reports to EPA and meetings and presentations to EPA at the conclusion of each major phase of the RA.
- d. A description of the community relations support activities to be conducted during the RA. At EPA's request, Defendant shall assist EPA in preparing and disseminating information to the public regarding the RA work to be performed.
- e. Components addressing strategy for delivering the project, which shall address the management approach for implementing the Remedial Action, including procurement methods and contracting strategy, phasing alternatives, and contractor and equipment availability concerns. If the construction of the remedy is to be accomplished by Defendants' "in-house" resources, the document shall identify those resources.
- f. Components addressing planning and management of construction, which shall be developed to indicate how the construction activities are to be implemented and coordinated with EPA during the RA. Defendants shall designate and identify the person who will serve as the Remedial Action Project Coordinator. This person will be on-site during the Remedial Action. These components in the RA Work Plan shall also identify other key project management personnel and lines of authority, and provide

descriptions of the duties of the key personnel along with an organizational chart. In addition, a plan for the administration of construction changes and EPA review and approval of those changes shall be included.

- g. An abbreviated Operation and Maintenance Plan (O&M), which must be approved by EPA prior to initiation of Operation and Maintenance activities. It is not anticipated that there will be any long-term operations for this remedial action, other than groundwater monitoring only at MW-7S and MW-7D. However, short-term maintenance will include ensuring re-vegetated areas thrive and the wetlands return to conditions as currently existing with respect to vegetation and wetlands on equivalent non-contaminated portions of the Site. Therefore, the O&M Plan may be abbreviated to only cover applicable items of the generic ones described below and may be submitted as part of the RA Work Plan. If necessary, the O&M Plan shall be modified to incorporate any design modifications implemented during the Remedial Action. The Performance Standards Verification Plan shall also include tasks that address O&M activities as set forth in the O&M Plan.

Upon approval of the O&M Plan, Defendants shall implement the O&M Plan in accordance with the schedule contained therein. This plan shall describe start-up procedures, operation, troubleshooting, training, and evaluation activities that shall be carried out by Defendants. At the 30 percent construction stage, Defendants shall submit an O&M manual for review, if deemed applicable by EPA. This manual shall include all necessary O&M information for the operating personnel. If deemed applicable, the O&M manual must be reviewed and approved by EPA prior to initiation of Operation and Maintenance activities. The plan shall address the following elements, if applicable:

1. Equipment start-up and operator training;
  - a. Technical specifications governing treatment systems;
  - b. Requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of the systems; and,
  - c. Schedule for training personnel regarding appropriate operational procedures once start-up has been successfully completed.
2. Description of normal operation and maintenance;
  - a. Description of tasks required for system operation;
  - b. Description of tasks required for system maintenance;
  - c. Description of prescribed treatment or operating conditions;
  - d. Schedule showing the required frequency for each O&M task.

3. Description of potential operating problems;
  - a. Description and analysis of potential operating problems;
  - b. Sources of information regarding problems; and
  - c. Common remedies or anticipated corrective actions.
4. Description of routine monitoring and laboratory testing;
  - a. Description of monitoring tasks;
  - b. Description of required laboratory tests and their interpretation;
  - c. Required QA/QC; and
  - d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.
5. Description of alternate O&M;
  - a. Should system fail, alternate procedures to prevent undue hazard; and
  - b. Analysis of vulnerability and additional resource requirements should a failure occur.
6. Safety Plan;
  - a. Description of precautions to be taken and required health and safety equipment, etc., for site personnel protection, and
  - b. Safety tasks required in the event of systems failure.
7. Description of equipment;
  - a. Equipment identification;
  - b. Installation of monitoring components;
  - c. Maintenance of site equipment; and
  - d. Replacement schedule for equipment and installation components.
8. Records and reporting;
  - a. Daily operating logs;
  - b. Laboratory records;
  - c. Records of operating cost;
  - d. Mechanism for reporting emergencies;
  - e. Personnel and Maintenance Records; and
  - f. Monthly reports to State/Federal Agencies.

2. Construction Health and Safety Plan/Contingency Plan

Defendants shall prepare a Construction Health and Safety Plan/Contingency Plan in conformance with Defendant's health and safety program, and in compliance with OSHA regulations and protocols. The Construction Health and Safety Plan shall include a health and safety risk analysis, a description of monitoring and personal protective equipment, medical monitoring, and site control. EPA will not approve Defendant's Construction Health and Safety Plan/Contingency Plan, but rather EPA will review it to ensure that all necessary elements are included, and that the plan provides for the protection of human health and the

environment. This plan shall include a Contingency Plan and incorporate Air Monitoring and Spill Control and Countermeasures Plans if determined by EPA to be applicable for the Site. The Contingency Plan is to be written for the onsite construction workers and the local affected population. It shall include the following items:

- a. Name of person who will be responsible in the event of an emergency incident.
- b. Plan for initial site safety indoctrination and training for all employees, name of the person who will give the training and the topics to be covered.
- c. Plan and date for meeting with the local community, including local, state and federal agencies involved in the cleanup, as well as the local emergency squads and the local hospitals.
- d. A list of the first aid and medical facilities including, location of first aid kits, names of personnel trained in first aid, a clearly marked map with the route to the nearest medical facility, all necessary emergency phone numbers conspicuously posted at the job site (i.e., fire, rescue, local hazardous material teams, National Emergency Response Team, etc.)
- e. Plans for protection of public and visitors to the job site.
- f. Air Monitoring Plan which incorporates the following requirements:
  - 1) Air monitoring shall be conducted on Site. The chemical constituents that were identified during the Risk Assessment shall serve as a basis of the sampling for and measurement of pollutants in the atmosphere. Defendants shall clearly identify these compounds and the detection and notification levels required in Paragraph 4 below. Air monitoring shall include personnel monitoring and on-site area monitoring.
  - 2) Personnel monitoring shall be conducted according to OSHA and NIOSH regulations and guidance.
  - 3) Onsite Area Monitoring shall consist of real-time monitoring performed immediately adjacent to any waste excavation areas, treatment areas, and any other applicable areas when work is occurring. Measurements shall be taken in the breathing zones of personnel and immediately upwind and downwind of the work areas. Equipment shall include the following, at a minimum: organic vapor meter and particulate monitoring equipment.

g. A Spill Control and Countermeasures Plan which shall include the following:

- 1) Contingency measures for potential spills and discharges from materials handling and/or transportation.
- 2) A description of the methods, means, and facilities required to prevent contamination of soil, water, atmosphere, and uncontaminated structures, equipment, or material by spills or discharges.
- 3) A description of the equipment and personnel necessary to perform emergency measures required to contain any spillage and to remove spilled materials and soils or liquids that become contaminated due to spillage. This collected spill material must be properly disposed of.
- 4) A description of the equipment and personnel to perform decontamination measures that may be required for previously uncontaminated structures, equipment, or material.

B. Preconstruction Conference

A Preconstruction Conference shall be held after selection of the construction contractor but before initiation of construction. This conference shall include Defendants and federal, state and local government agencies as appropriate and shall:

1. Define the roles, relationships, and responsibilities of all parties;
2. Review methods for documenting and reporting inspection data;
3. Review methods for distributing and storing documents and reports;
4. Review work area security and safety protocols;
5. Review the Construction Schedule;
6. Conduct a site reconnaissance to verify that the design criteria and the plans specifications are understood and to review material and equipment storage locations.

The Preconstruction Conference must be documented by the Defendants, including names of people in attendance, issues discussed, clarifications made, special instructions issued, etc. The documentation shall be submitted to EPA within 30 days after the preconstruction conference.

C. Prefinal Construction Inspection/ Final Construction Inspection

Upon preliminary project completion Defendants shall notify EPA for the purpose of conducting a Prefinal Construction Inspection. Participants should include the Project Coordinators, Construction Contractor, EPA Remedial Project Manager, and Natural Resource Trustees. Other federal, state, and local agencies with a jurisdictional interest shall be invited. The Prefinal Inspection shall consist of a walk-through inspection of the entire project site. The objective of the inspection is to determine whether the construction is complete and consistent with the CD. Any outstanding construction items discovered during the inspection shall be identified and noted on a punch list. Additionally, treatment equipment (if any) shall be operationally tested by Defendants. Defendants shall certify that the equipment has performed to effectively meet the purpose and intent of the specifications. Retesting shall be completed where deficiencies are revealed.

If no construction items were found outstanding in the Prefinal Construction Inspection, that inspection shall serve as the Final Construction Inspection and the pre-certification inspection, if Defendants have provided certification to the United States prior to the inspection as provided in Section E of this Task II. In such case, Defendants shall submit a Final Inspection Report detailed in this Task II section.

If construction items were found outstanding in the Prefinal Construction Inspection, a Prefinal Construction Inspection Report shall be submitted by Defendants within 7 days of the inspection, which outlines the outstanding construction items, actions required to resolve the items, completion date for the items, and an anticipated date for the Final Inspection.

Upon completion of all outstanding construction items, Defendants shall notify EPA for the purpose of conducting a Final Construction Inspection. This Final Construction Inspection shall serve as the pre-certification inspection, if Defendants have provided certification to the United States prior to the inspection as provided in Section E of this Task II, if the Prefinal Construction Inspection indicated outstanding construction items, and if those outstanding construction items are not found outstanding in the Final Construction Inspection. The Final Construction Inspection shall consist of a walk-through inspection of the entire project site. The Prefinal Construction Inspection Report shall be used as a check list with the Final Construction Inspection focusing on the outstanding construction items identified in the Prefinal Construction Inspection. All tests that were originally unsatisfactory shall be conducted again. Confirmation shall be made during the Final Construction Inspection that all outstanding items have been resolved. Any outstanding construction items discovered during the inspection still requiring correction shall be identified and noted on a punch list. If any items are still unresolved, the inspection shall be considered to be a Prefinal Construction Inspection requiring another Prefinal Construction Inspection Report and subsequent Final Construction Inspection.

D. Final Construction Report

Within thirty (30) days following the conclusion of the Final Construction Inspection, Defendants shall submit a Final Construction Report. EPA will review the draft report and will provide comments to Defendants. The Final Construction Report shall include the following:

1. Brief description of how outstanding items noted in the Prefinal Inspection were resolved;
2. The date of the final inspection, a roster of participants and summary of findings;
3. Explanation of modifications made during the RA to the original RD and RA Work Plans and why these changes were made;
4. Drawings that illustrate the dimensions of excavations, locations of confirmation samples, locations/dimensions of areas backfilled or applied with limestone or similar alkaline substance, and locations of replacement ponds/wetlands, at a minimum.
5. Synopsis of the construction work defined in the SOW and certification that the construction work has been completed.

E. Remedial Action Report

As provided in Section IX of the CD, within 90 days after Defendants conclude that the Remedial Action has been fully performed and the Performance Standards have been attained, Defendants shall so certify to the United States and shall schedule and conduct a pre-certification inspection to be attended by EPA and Defendants. As provided in Section C of this Task II, the Prefinal Construction Inspection shall serve as the pre-certification inspection if Defendants have provided certification to the United States and no construction items are outstanding. If after the pre-certification inspection Defendants still believes that the Remedial Action has been fully performed and the Performance Standards have been attained, Defendants shall submit a Remedial Action (RA) Report to EPA in accordance with Section IX of the CD. The RA Report shall include the following:

1. A copy of the Final Construction Report;
2. Synopsis of the work defined in this SOW and a demonstration in accordance with the Performance Standards Verification Plan that Performance Standards have been achieved;
3. Certification that the Remedial Action has been completed in full satisfaction of the requirements of the CD, and;

4. If applicable, a description of how Defendants will implement any remaining operations and maintenance as required in the RA Work Plan and as specified in the Performance Standards Verification Plan.

After EPA review, Defendants shall address any comments and submit a revised report. As provided in Section IX of the CD, the Remedial Action shall not be considered complete until EPA approves the RA Report.

### TASK III - PERFORMANCE MONITORING

Performance monitoring shall be conducted to ensure that all Performance Standards are met. Operation and Maintenance (O&M) shall be performed in accordance with the approved RA Work Plan and as specified in this Performance Standards Verification Plan.

#### A. Performance Standards Verification Plan

The purpose of the Performance Standards Verification Plan (PSVP) is to provide a mechanism to ensure that both short-term and long-term Performance Standards for the Remedial Action are met. Defendants shall submit a Performance Standards Verification Plan with the Remedial Action Work Plan. Once approved, Defendants shall implement the Performance Standards Verification Plan on the approved schedule.

The PSVP shall ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data generated will meet the DQOs established.

The PSVP shall include a Field Sampling and Analysis Plan (FSAP) and a Quality Assurance Project Plan (QAPP). The FSAP shall define in detail the sampling and data-gathering methods that shall be used on the project. It shall include sampling objectives, sample location (horizontal and vertical) and frequency, sampling equipment and procedures, and sample handling and analysis, including sampling with respect to groundwater for the purpose of O&M as set forth in the RA Work Plan. The Field Sampling and Analysis Plan shall be written so that a field sampling team unfamiliar with the Site would be able to gather the samples and field information required.

The QAPP shall describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that shall be used to achieve the desired DQOs. The DQOs shall, at a minimum, reflect use of analytical methods for obtaining data of sufficient quality to meet National Contingency Plan requirements as identified at 300.435 (b). In addition, the QAPP shall address personnel qualifications, sampling procedures, sample custody, analytical procedures, and data reduction, validation, and reporting. These procedures must be consistent with the Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual and the guidances specified in Section XV of the CD.

The QAPP shall also contain applicable components of a construction quality assurance plan, of those listed below, to ensure, with a reasonable degree of certainty, that the completed Remedial Action meets or exceeds all design criteria, plans and specifications, and Performance Standards.

1. A description of the quality control organization, including a chart showing lines of authority, identification of the members of the Independent Quality Assurance Team (IQAT), and acknowledgement that the IQAT will implement the control system for all aspects of the work specified and shall report to the Project Coordinator and EPA. The IQAT members shall be responsible for the QA/QC of the Remedial Action. The members of the IQAT shall have a good professional and ethical reputation, previous experience in the type of QA/QC activities to be implemented and demonstrated capability to perform the required activities.
2. The name, qualifications, duties, authorities, and responsibilities of each person assigned a QC function.
3. Description of the observations and control testing that will be used to monitor the construction and/or installation of the components of the Remedial Action. This includes information which certifies that personnel and laboratories performing the tests are qualified and the equipment and procedures to be used comply with applicable standards. Any laboratories to be used shall be specified. Acceptance/Rejection criteria and plans for implementing corrective measures shall be addressed.
4. A schedule for managing submittals, testing, inspections, and any other QA function (including those of contractors, subcontractors, fabricators, suppliers, purchasing agents, etc.) that involve assuring quality workmanship, verifying compliance with the plans and specifications, or any other QC objectives. Inspections shall verify compliance with all environmental requirements and include, but not be limited to, air quality and emissions monitoring records and waste disposal records, etc.
5. Reporting procedures and reporting format for QA/QC activities including such items as daily summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation.
6. A list of definable features of the work to be performed. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements.

Defendants shall demonstrate in advance and to EPA's satisfaction that each laboratory it may use is qualified to conduct the proposed work and meets the requirements specified in Section XV of the CD. EPA may require that Defendants submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel

qualifications, equipment and material specification, and laboratory analyses of performance samples (blank and/or spike samples). In addition, EPA may require submittal of data packages equivalent to those generated by the EPA Contract Laboratory Program (CLP).

The PSVP shall also specify those tasks to be performed by Defendants to demonstrate compliance with the Performance Standards and a schedule for the performance of these tasks, including those tasks, e.g. site inspections, with respect to O&M as set forth in the RA Work Plan.

#### B. Five-Year Review

Because the selected remedy results in hazardous substances, pollutants, or contaminants remaining at the site, according to CERCLA §121(c), a review of the remedy shall occur within five years after the initiation of the remedial action to assure that the remedy is protective of human health and the environment. The Defendant shall prepare the Five-Year Review Report in accordance with the *Comprehensive Five-Year Review Guidance*, June 2001, (OSWER No. 9355.7-03B-P, EPA 540-R-01-007) and any subsequent revisions or supplements to that guidance. Five-Year Review guidance documents can currently be found at: <http://www.epa.gov/superfund/resources/5year/index.htm>. The report format should follow the template found in Appendix E of the guidance, as well as include information identified in that appendix. EPA must perform certain aspects of the Five-Year Review, including Community Involvement, Site Inspection, making the Protectiveness Statement, and reviewing and approving the report. The draft report shall be submitted to EPA at least six months prior to the approval due date. The final report is due to be approved by the Waste Management Division Director (or designee) within five years from the initiation of the remedial action. As stated in section 1.2.4 of the *Comprehensive Five-Year Review Guidance*, five-year reviews will “no longer be required when no hazardous substances, pollutants, or contaminants remain on site above levels that allow for unlimited use and unrestricted exposure.”

## REFERENCES

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RD/RA process. Defendants shall review these guidances and shall use the information provided therein in performing the RD/RA and preparing all deliverables under this SOW.

1. "National Oil and Hazardous Substances Pollution Contingency Plan, Final Rule," Federal Register 40 CFR Part 300, March 8, 1990.
2. "Superfund Remedial Design and Remedial Action Guidance," U.S. EPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355.O-4A.
3. "Interim Final Guidance on Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties," U.S. EPA, Office of Emergency and Remedial Response, February 14, 1990, OSWER Directive No. 9355.5-01.
4. "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 355.3-01.
5. "A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.
6. "EPA NEIC Policies and Procedures Manual," EPA-330/9-78-001-R, May 1978, revised November 1984.
7. "Data Quality Objectives for Remedial Response Activities," U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.
8. "Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.
9. "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.
10. "Users Guide to the EPA Contract Laboratory Program," U.S. EPA, Sample Management Office, August 1982.

11. "Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual," U.S. EPA Region IV, Environmental Services Division, February 1, 1991, (revised periodically).
12. "USEPA Contract Laboratory Program Statement of Work for Organics Analysis," U.S. EPA, Office of Emergency and Remedial Response, February 1988.
13. "USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis," U.S. EPA, Office of Emergency and Remedial Response, July 1988.
14. "Quality in the Constructed Project: A Guideline for Owners, Designers, and Constructors, Volume 1, Preliminary Edition for Trial Use and Comment," American Society of Civil Engineers, May 1988.
15. "Interim Guidance on Compliance with Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.
16. "CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (Draft), OSWER Directive No. 9234.1-01 and -02.
17. "Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, (Draft), OSWER Directive No. 9283.1-2.
18. "Guide for Conducting Treatability Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, Pre-publication Version.
19. "Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.
20. "Standard Operating Safety Guides," U.S. EPA, Office of Emergency and Remedial Response, November 1984.
21. "Standards for General Industry," 29 CFR Part 1910, Occupational Health and Safety Administration.
22. "Standards for the Construction Industry," 29 CFR 1926, Occupational Health and Safety Administration.
23. "NIOSH Manual of Analytical Methods," 2d edition. Volumes I - VII, or the 3rd edition, Volumes I and II, National Institute of Occupational Safety and Health.

24. "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," National Institute of Occupational Safety and Health/Occupational Health and Safety Administration/United States Coast Guard/ Environmental Protection Agency, October 1985.
25. "TLVs - Threshold Limit Values and Biological Exposure Indices for 1987 - 88," American Conference of Governmental Industrial Hygienists.
26. "American National Standards Practices for Respiratory Protection," American National Standards Institute Z88.2-1980, March 11, 1981.
27. "Quality in the Constructed Project - Volume 1," American Society of Civil Engineers, 1990.
28. "Comprehensive Five-Year Review Guidance," U.S. EPA, Office of Emergency and Remedial Response, June 2001, OSWER Directive No. 0355.7-03B-P.
29. Code of Federal Regulations, Title 40 - Protection of the Environment, Part 261.24, Toxicity Characteristic, US Government Publishing Office, 2004.
30. Code of Federal Regulations, Title 40 - Protection of the Environment, Part 300, National Oil and Hazardous Substances Pollution Contingency Plan, Appendix A, US Government Publishing Office, 2004.
31. North Carolina Administrative Code Title 15A, Subchapter .02B, State of North Carolina, 2004.
32. "QA/QC Guidance for Sampling and Analysis of Sediments, Water and Tissues for Dredged Material Evaluations – EPA-823-B-95-001," US EPA, April 1995.
33. "SW-846 Test Methods for Evaluating Solid Waste," US EPA.

**SUMMARY OF THE MAJOR DELIVERABLES FOR THE  
REMEDIAL ACTION AT THE  
REASOR CHEMICAL COMPANY SUPERFUND SITE**

<u>DELIVERABLE</u>	<u>EPA RESPONSE</u>
Monthly Progress Reports as required by CD section X (2)	Review
<u>TASK I</u> <u>PROJECT PLANNING</u>	
No deliverables planned as part of Task I.	
<u>TASK II</u> <u>REMEDIAL ACTION</u>	
RA Work Plan (5)	Review and Approve
Construction Health and Safety Plan/Contingency Plan (3)	Review and Comment
Operation and Maintenance Manual, if applicable (5)	Review and Approve
Prefinal Construction Inspection Report, if applicable (5)	Review and Approve
Final Construction Report (5)	Review and Approve
Remedial Action Report (5)	Review and Approve
<u>TASK III</u> <u>Monitoring</u>	
Performance Standards Verification Plan (5)	Review and Approve
Five Year Review Report (5)	Review and Approve

\* NOTE: The number in parenthesis indicates the number of copies to be submitted by Defendants. One copy shall be unbound, the remainder shall be bound. One of the copies shall be submitted directly to the State contact identified in the CD. The remainder of the copies shall be sent to the RPM. All approved, final documents shall also be submitted to the RPM in electronic format, within 15 days of document approval notification. The reviews, comments and approvals will be documented by letters from the RPM.